

FIG. 1

One period of
cogging torque

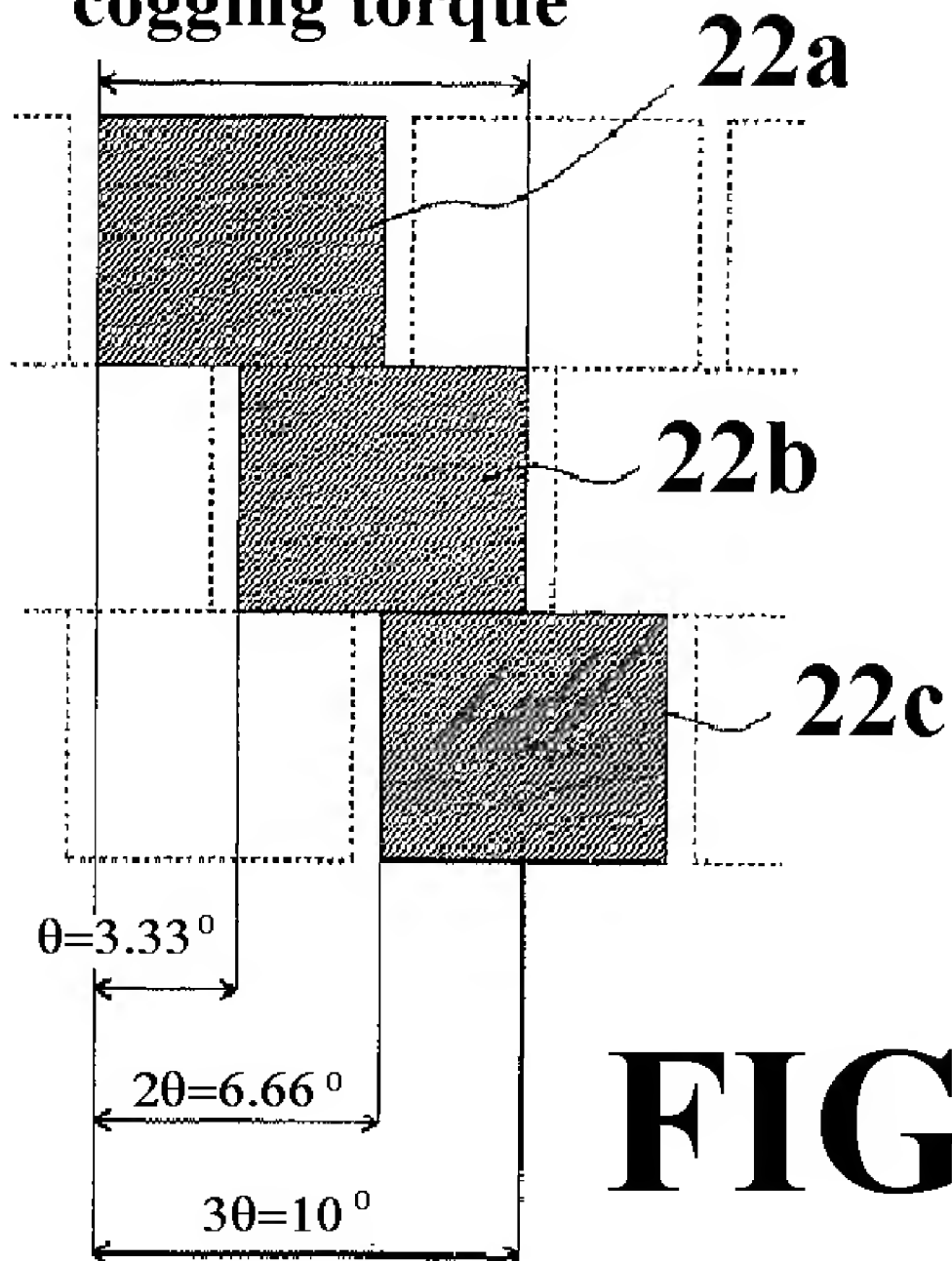
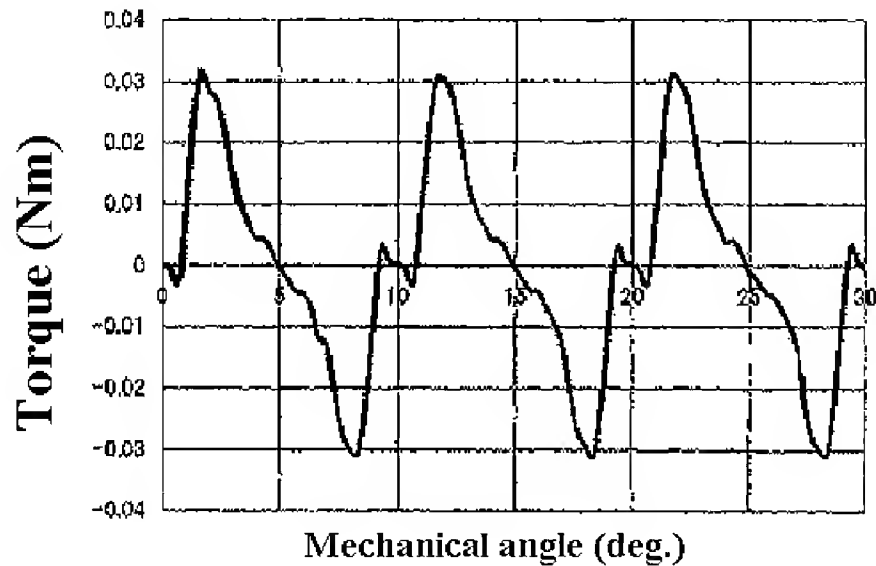


FIG. 2

FIG. 3

Cogging wave single stage



Cogging wave 3 stages skewed

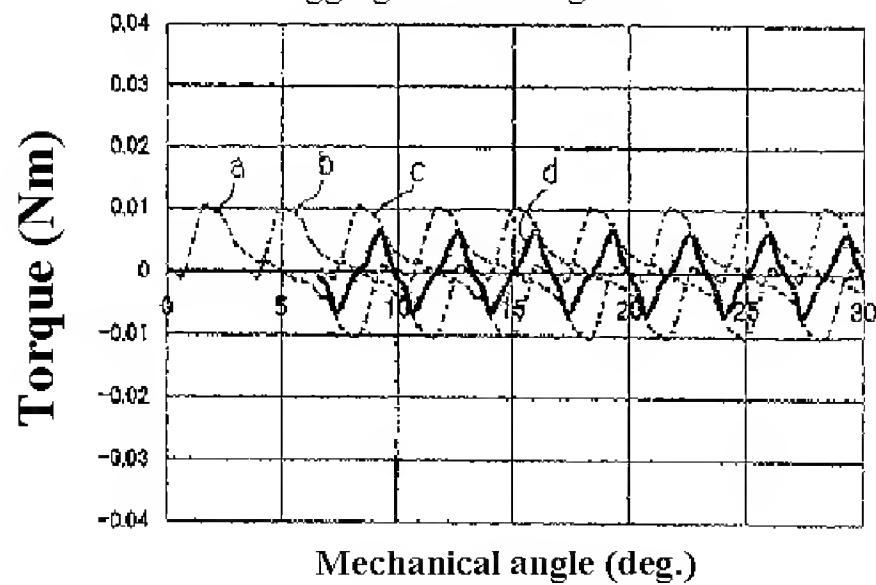


FIG. 4

FIG. 5

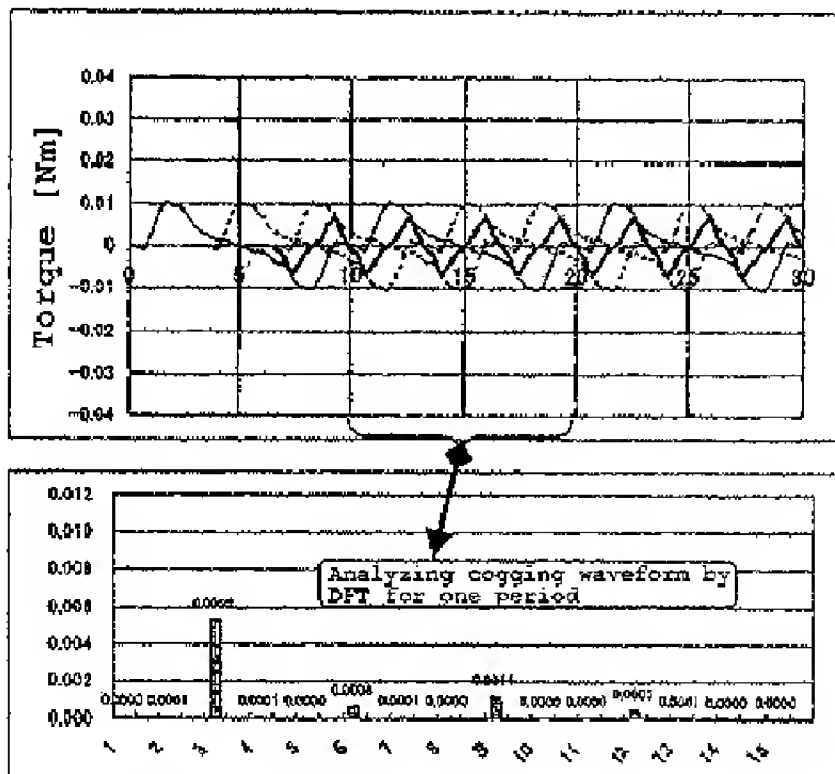
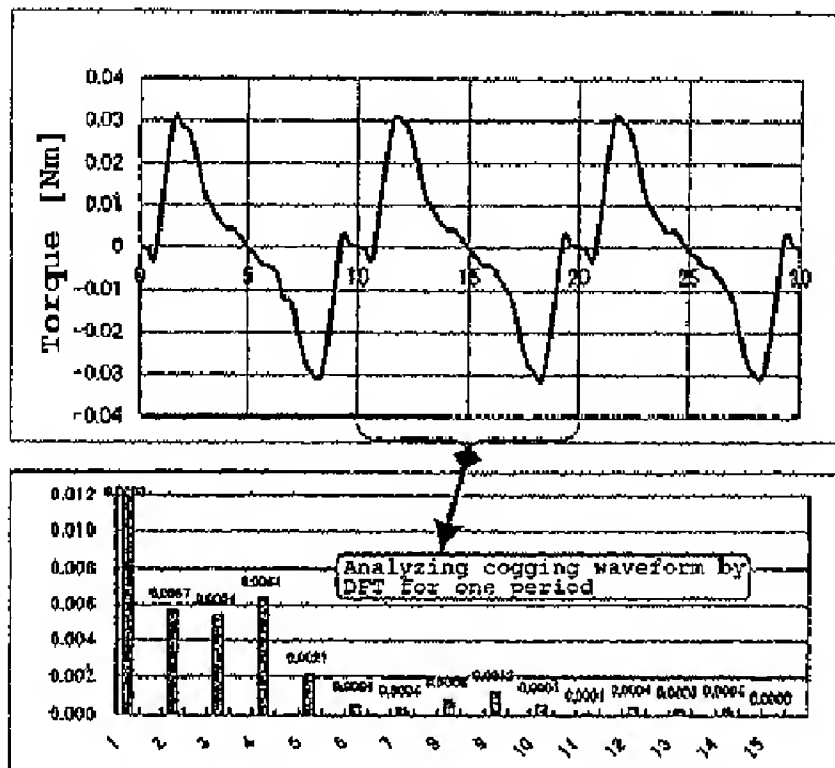
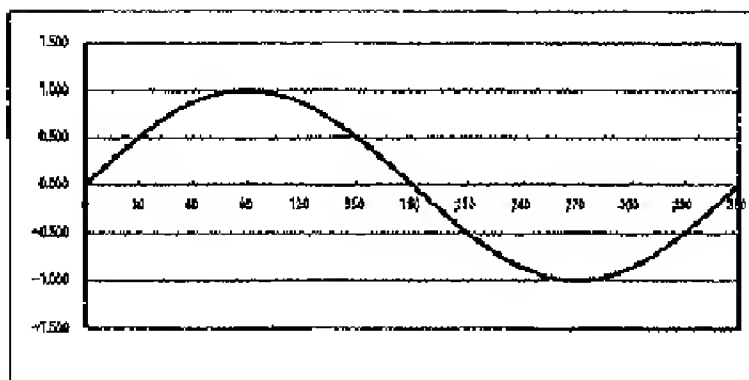
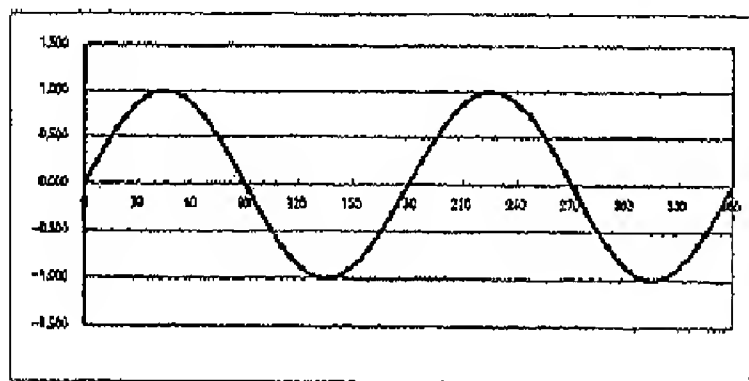


FIG. 6

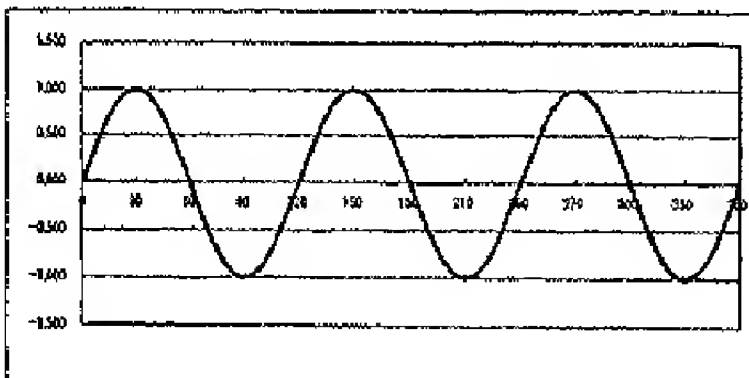
1st order



2nd order



3rd order



4th order

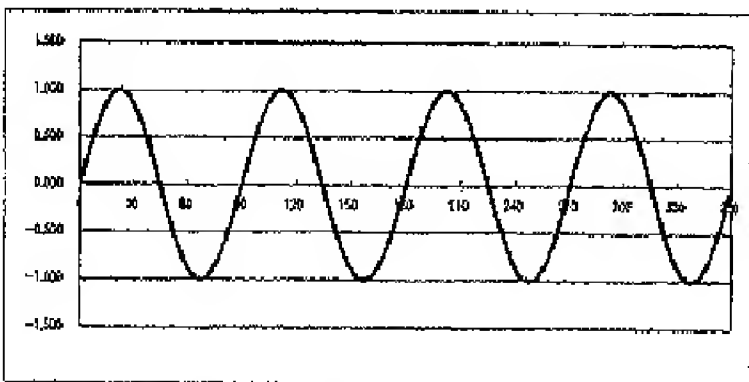
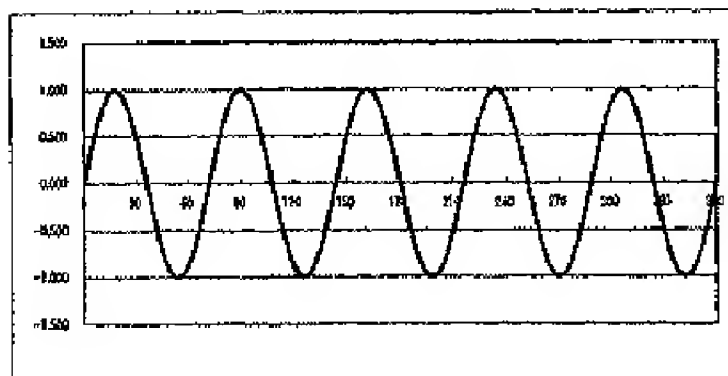
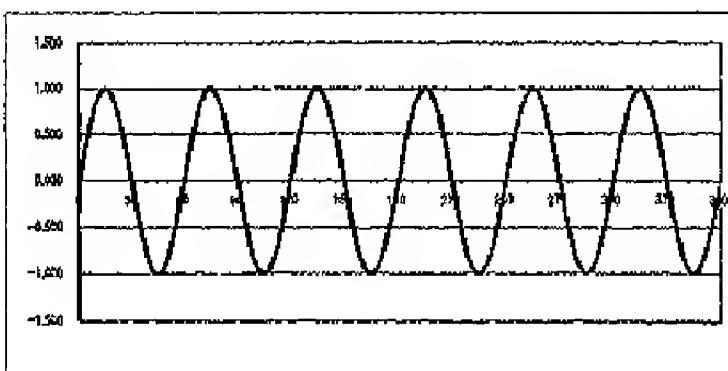


FIG. 7

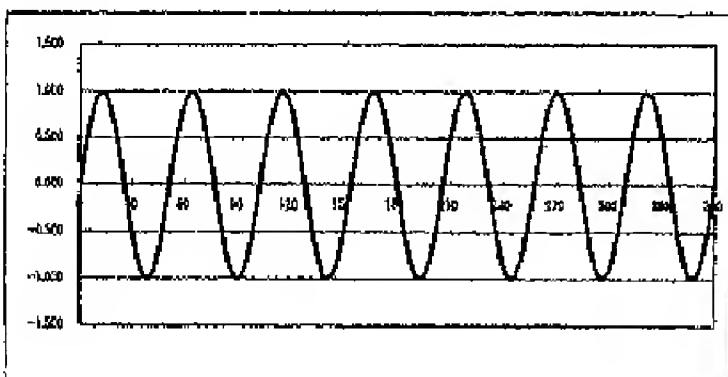
5th order



6th order



7th order



8th order

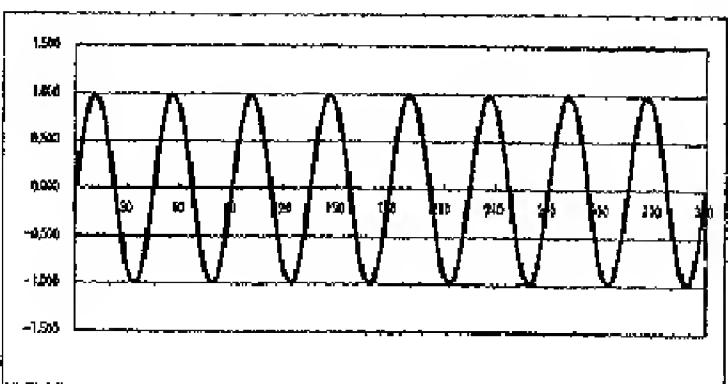
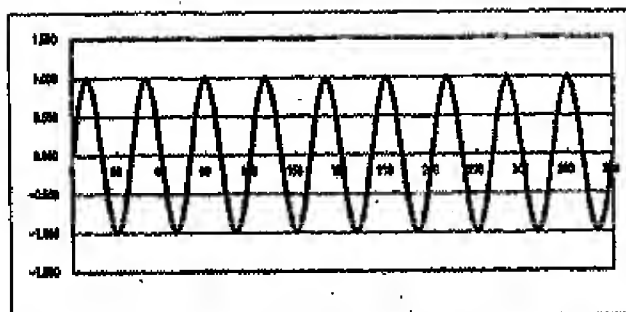
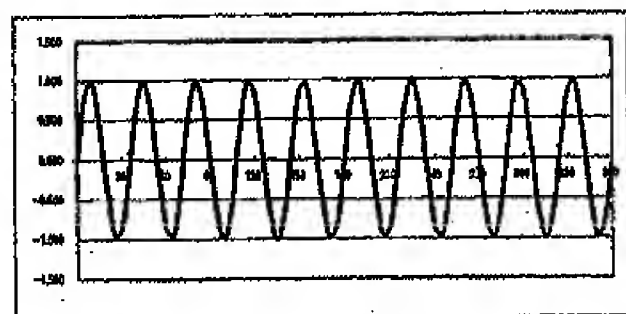


FIG. 8

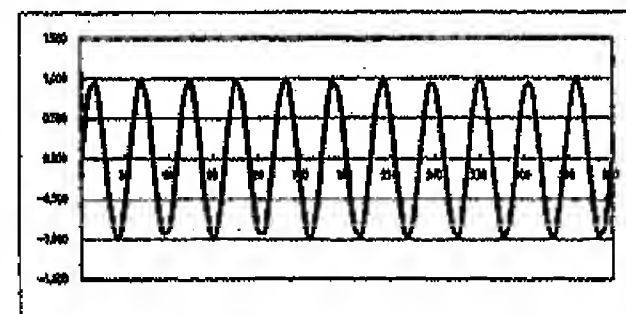
9th order



10th order



11th order



12th order

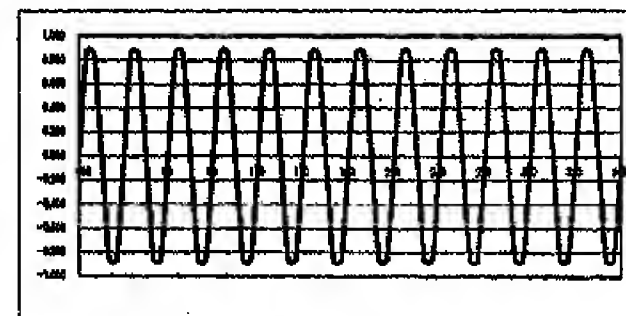
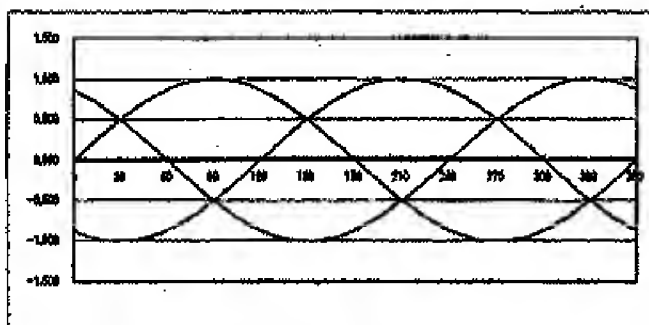
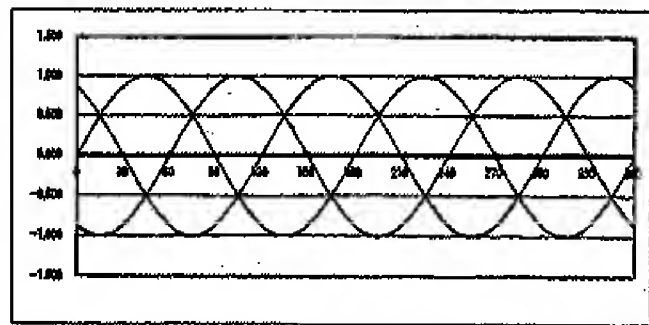


FIG.9

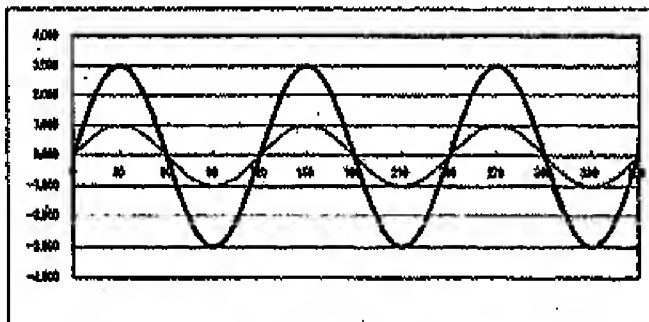
1st order



2nd order



3rd order



4th order

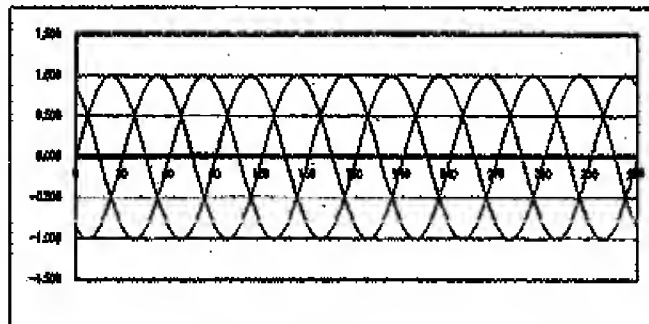
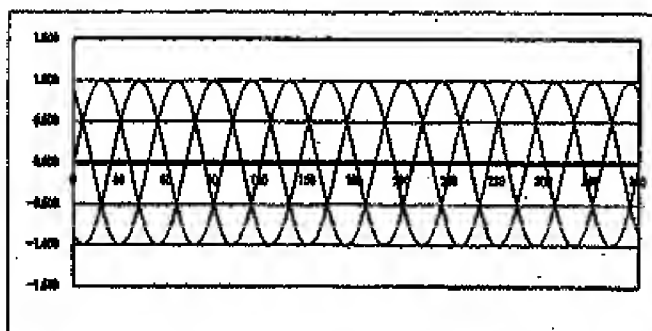
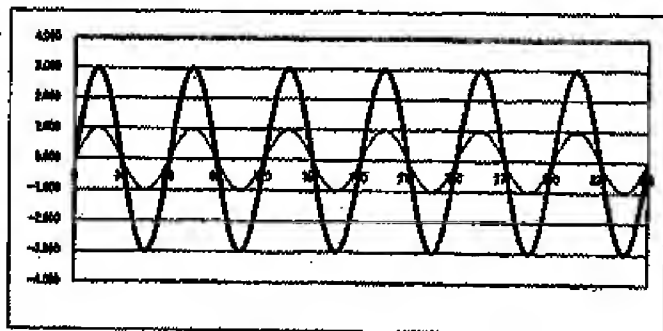


FIG. 10

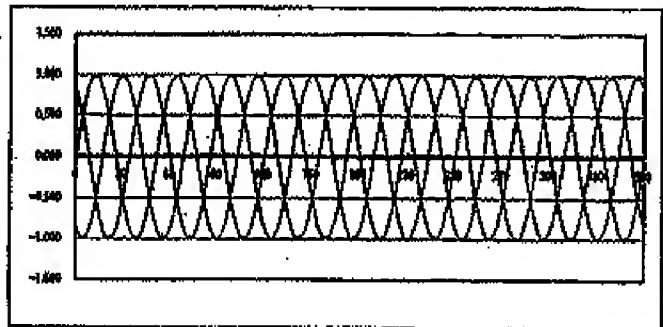
5th order



6th order



7th order



8th order

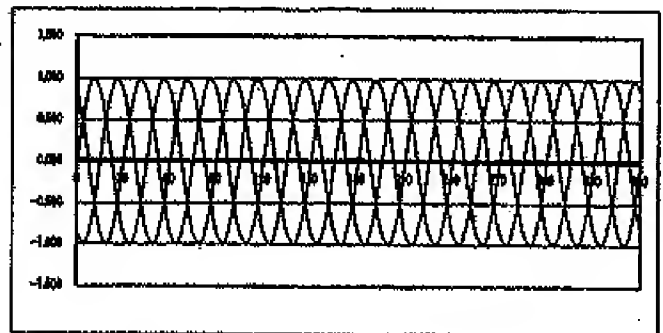
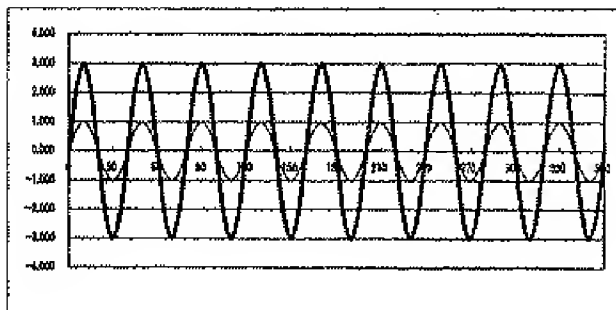
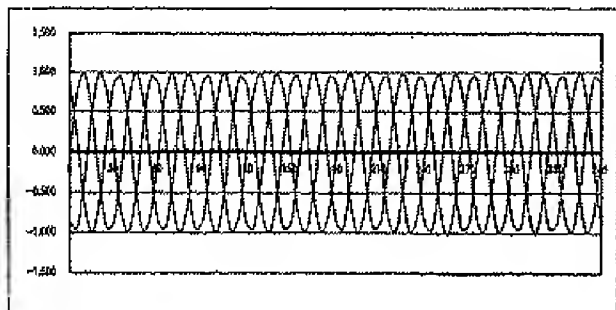


FIG.11

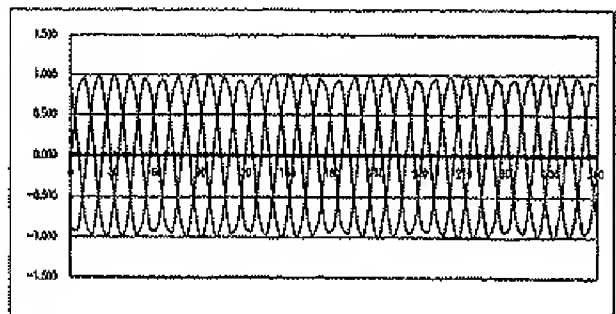
9th order



10th order



11th order



12th order

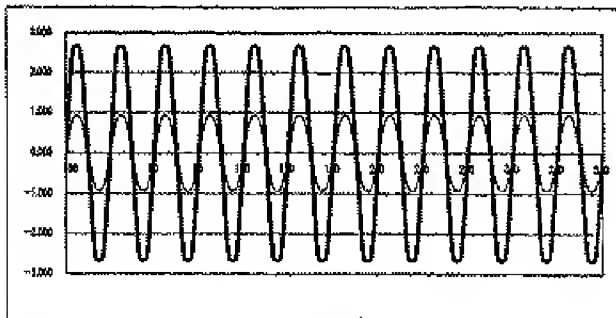


FIG.12

FIG.13

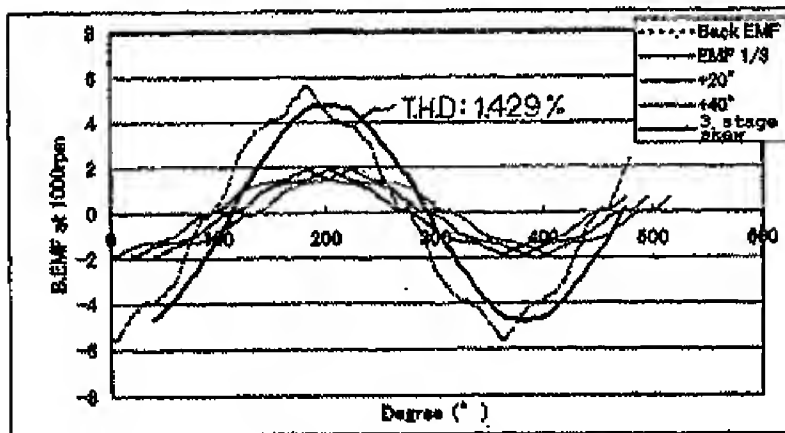
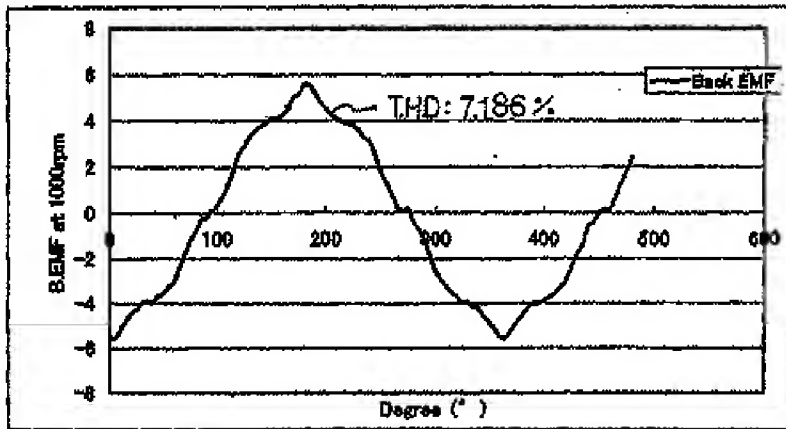


FIG. 14

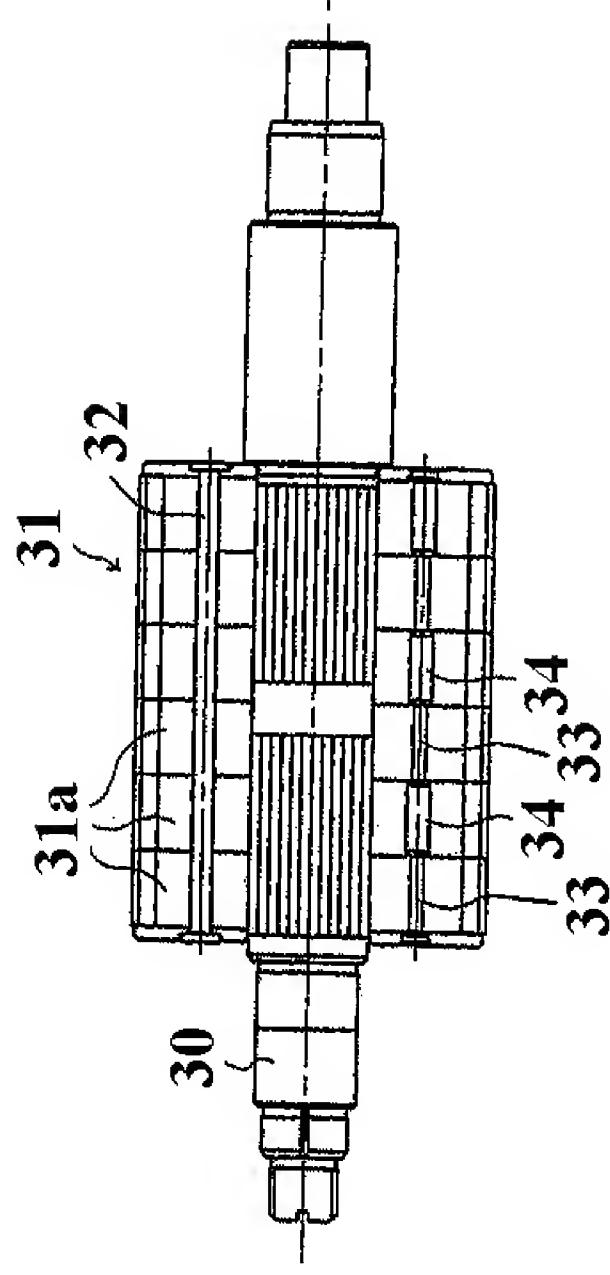


FIG. 15

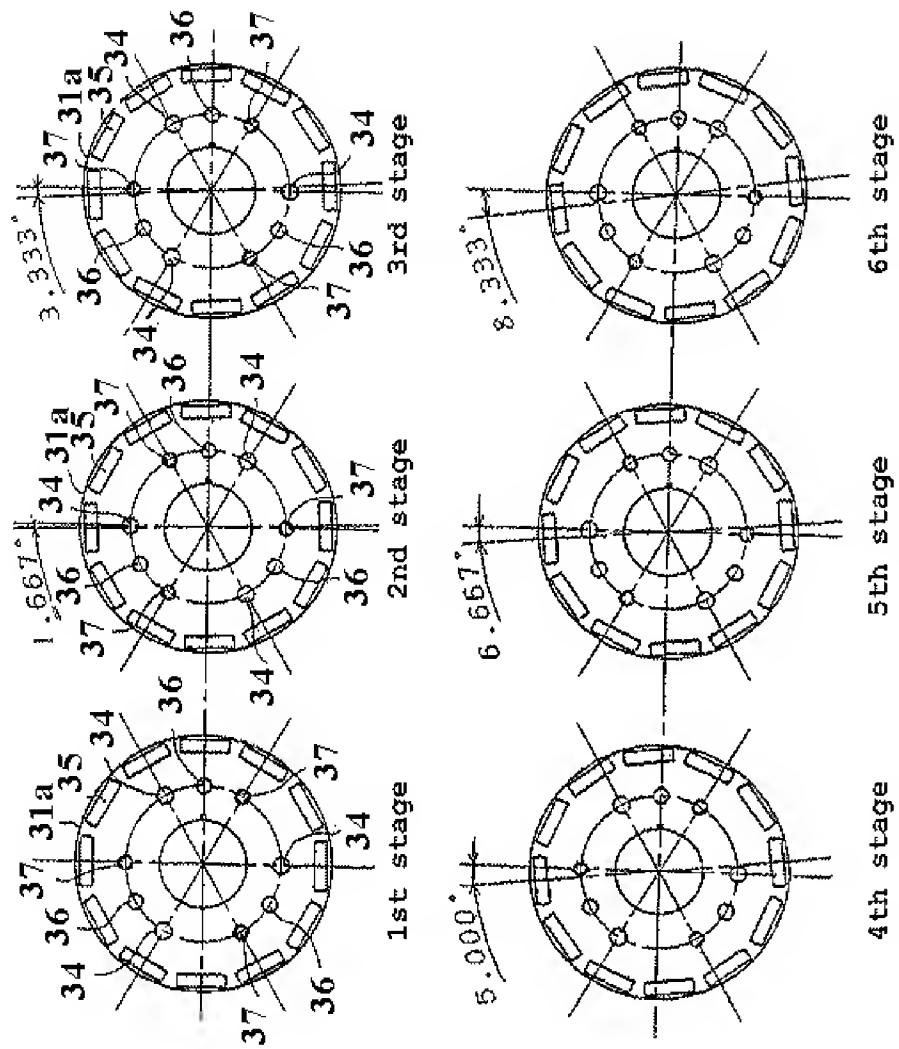


FIG. 16

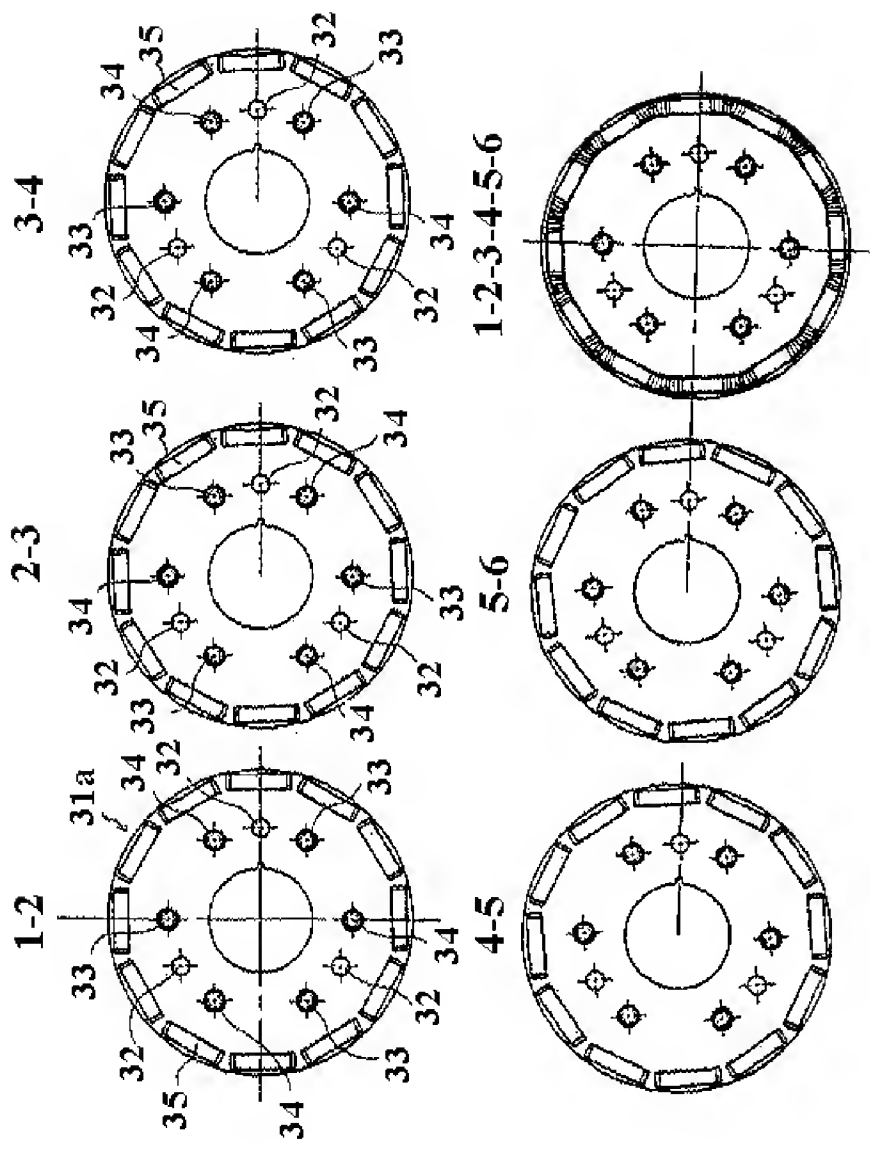
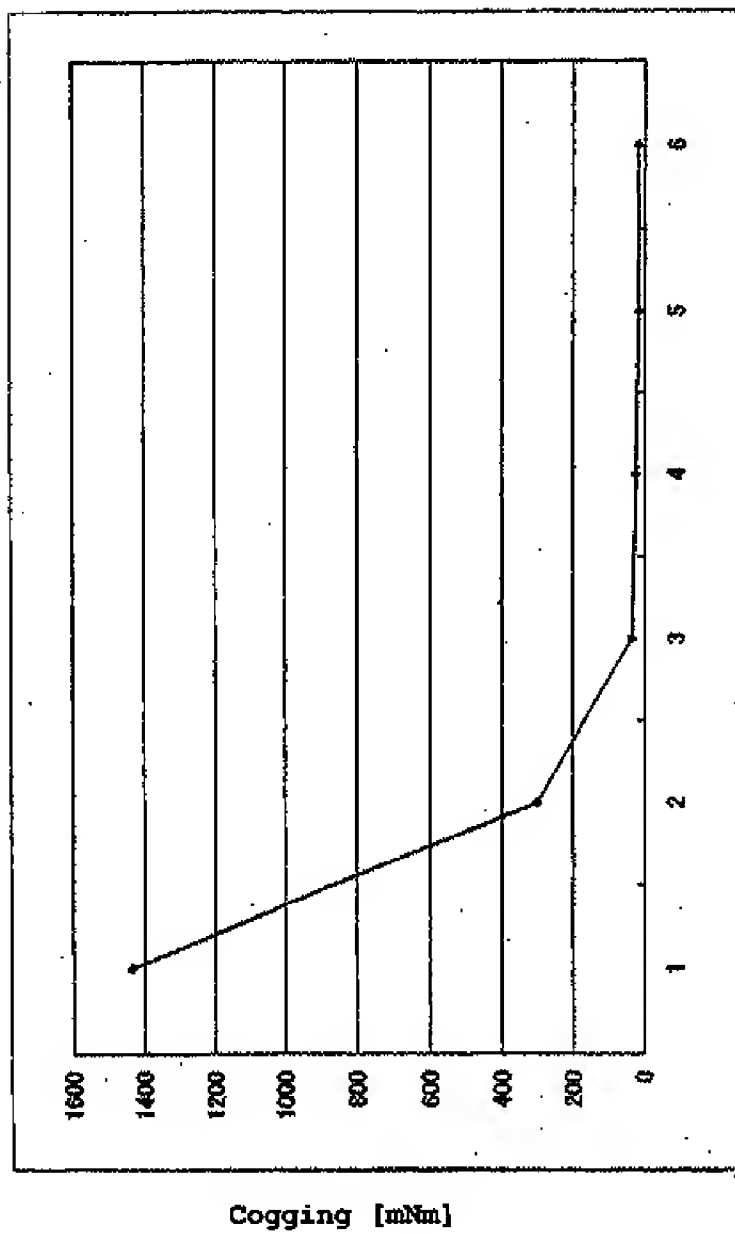


FIG. 17

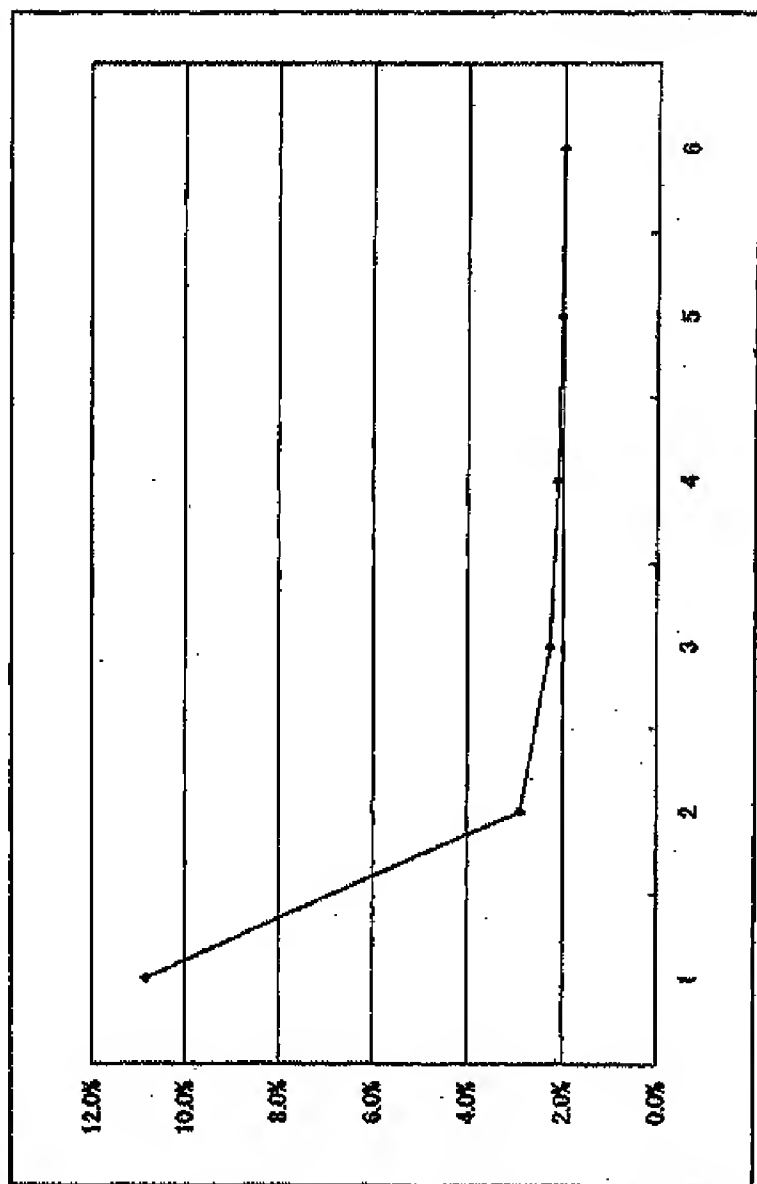
Cogging torque vs. Number of skewed stages



Stage

FIG. 18

Speed electromotive force distortion rate T.H.D. vs. Number of skewed stages



Stage

FIG. 19

Speed electromotive force
distortion rate T.H.D. (%)